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ECOSYSTEM MANAGEMENT IN THE BLM

A Process to Promote Biological Diversity and Sustainable Development

DRAFT CONCEPT PAPER FOR PUBLIC COMMENT



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"I think all of us are increasingly awakening to the fact that we live in a world without borders."

—Secretary of the Interior Bruce Babbitt

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TABLE OF CONTENTS

Share Your Thoughts With Us	p. 4
Introduction	p. 5
What is Ecosystem Management?	p. 6
How will Ecosystem Management Differ from Current Management?	p. 7
Ecosystem Management Principles	p. 9
Moving Towards Ecosystem Management: Examples in the BLM	p. 14
Glossary	p. 16
BLM Ecosystem Management Team	p. 18

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Share Your Thoughts With Us

This paper presents the *concept* for ecosystem management. It does not attempt to outline specific processes to be developed and implemented. It is not a policy. It is, rather, a *first step* in developing a more detailed strategy to achieve ecosystem management objectives over the long term. The concept presented here will be evaluated and revised as new information is presented, and as the BLM works toward implementation in consultation with partners and others interested in land management.

Challenge Us!

In moving toward an ecosystem approach, we are committed to involving public land users, constituents, "neighbors," and partners in every step of the process. We invite you to read this Concept Paper; share it with your staff and your publics; and challenge it. And then get back to us. Send your ideas to the Team Leader and/or contact one of the team members listed on page 18. The team will then be able to use this in developing ways to implement ecosystem management within the BLM.

INTRODUCTION

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Ecosystem Management recognizes that natural systems must be sustained in order to meet the social and economic needs of future generations.

There is a growing recognition, globally, that a fundamentally new approach to natural resource management is needed that takes a less compartmentalized view—an approach which assures that change will sustain the integrity, diversity and productivity of entire ecological systems while continuing to provide resource products, uses, values and services for present and future needs.

It is an approach that will help land managers meet growing challenges brought about by:

- new technologies
- changing global and local economies
- increasing population pressures
- broadening demands for a clean and healthy environment
- diverse cultural and ethnic demands
- loss of biological diversity

The Bureau of Land Management (BLM) is responsible for sustained and productive management of 270 million acres of diverse public lands and an additional 300 million acres of subsurface mineral rights. Over the last decade, the BLM has made significant progress in preparing to meet new challenges through an emphasis on better stewardship. The agency has restored riparian areas, rangeland conditions, water quality, and important fish and wildlife habitat in many locations. More emphasis is being placed on mining reclamation and whole forest ecology. Increasing recreation opportunities and protecting wilderness areas also is being emphasized.

These efforts have put the BLM in an excellent position to become a creative participant in the next phase of responsible stewardship—a phase which can best be realized through an ecosystem management approach. For the BLM, this approach would build on what the agency already has accomplished through multiple use management, although it will require extensive change in some areas such as budgeting, planning, and workload adjustments.

Managing for healthy ecosystems will promote biological diversity and sustainable development.

What is ecosystem management?

Ecosystem management is a process that considers the total environment. It is the skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity and diverse conditions, uses, products, values, and services over the long-term (See glossary, page 16). Management of individual components of ecological systems for immediate needs is expanded to management centered on long-term goals and objectives targeted to the entire ecological system across jurisdictional lines.

Ecosystem management will require a higher level of cooperation among varied public interests—all of whom are actively involved in decision making processes.

An ecosystem management approach allows the BLM to participate in a coordinated effort to identify and achieve desired management outcomes for all levels, from local to entire regions. Adopting ecosystem management provides for use of lands and resources to meet environmental, economic, cultural and social needs of the Nation while sustaining the diversity and productivity of ecosystems.

Ecosystem management relies on good science. It recognizes that humans and their social and economic needs are an integral part of ecological systems.



Ecosystem management will not eliminate the necessity for making tough decisions.

Ecosystem management may or may not coincide with administrative or geographic boundaries. It therefore will require a higher level of shared decision making among varied public interests, users, land managers, program specialists, scientists and technicians—all of whom are actively involved in decision making processes. In a process of ecosystem management, land managers monitor, evaluate and revise decisions to achieve shared, responsible use of the public lands.

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Ecosystem management will not eliminate the necessity for making tough decisions. It will help the BLM more effectively restore and maintain healthy ecosystems—on which biodiversity and sustained development for future generations ultimately will depend.

In the long run, ecosystem management offers a more cost effective approach, because people will be working together, within and outside of the agency, sharing ideas and information and avoiding duplication. It will also help minimize the need for costly reactive responses to symptoms of unhealthy ecosystems.

Ecosystem management will still require site-specific considerations. Management at all levels will continue. Thus, the BLM will continue to meet its obligations to conserve threatened and endangered species and resolve site-specific conflicts. By taking an ecosystem approach, however, the number of these conflicts ultimately will be reduced.

Ecosystem management will help the BLM:

1. Manage the public lands to ensure healthy ecosystems,
2. Ensure that as public lands are used and developed, natural systems are sustained so they are able to meet the present and future needs of society,
3. Manage the public lands as integral ecological, economic, social, and cultural units of larger surrounding landscapes owned and administered by multiple parties.

How will ecosystem management differ from current management?

Multiple-use management can logically evolve to support ecosystem management. It already demands interaction with a variety of public interests and users, and in many ways, has begun to move toward the management of natural systems. Ecosystem management will, however, place decidedly different demands upon multiple-use management agencies. It will require a greater emphasis on:

- Considering the function of non-BLM lands in planning, managing, and monitoring;
- Coordinating, collaborating, and cooperating with other affected agencies, land owners and interested parties;
- Budgeting and planning for interdisciplinary approaches to areas and projects;

- Managing for future ecosystem conditions and functions based on historic, ecologic, economic, and social considerations;
- Monitoring representative ecosystem conditions and use of scientific and technical knowledge so management can be more adaptive in response to new information and change;
- Making inventory, monitoring and research data more useful and comparable among responsible agencies, across ecosystem boundaries, and between data types;
- Sustaining ecosystems at all scales (local to regional to national) while using them to produce resources.

ECOSYSTEM MANAGEMENT PRINCIPLES

Ecosystem management represents a better way to manage and is consistent with the BLM's mission and direction under the Federal Land Policy and Management Act (FLPMA). It also is supported by other laws guiding the Bureau's mission.

... "the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people"

... "harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the environment with consideration being given to the relative values of the resources and not the combination of uses that will give the greatest economic return or the greatest economic output"

(From FLPMA, definition of multiple use)

... "to declare a National Policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the nation"

(From the National Environmental Policy Act)

Ecosystem management considers the following:

- Sustainability is essential to long term ecological health and social well being.
- Resource use on all scales can be brought into harmony with the environment.
- Ecological systems are a function of their parts, and lands are considered in terms of their function in the ecosystem in which they are located.
- Decisions reflect consideration of a broad range of topics rather than individual species or single uses.
- Ecological systems may need to be restored through carefully planned human intervention.
- Research and monitoring are necessary to support management that is responsive to change.
- Today's people are responsible for the health and productivity of tomorrow's ecosystems.

The process of ecosystem management in the BLM is governed by the principles described below.

Sustainable Ecosystems

Sustain the productivity and diversity of ecosystems and provide for human values, products, and services.

Managing the public lands involves an ethic of sustaining viable ecological processes and interactions throughout the landscape. This means caring for the land by protecting, maintaining or restoring the ecological integrity of its physical and biological processes, i.e. soil, water, air, and biological diversity. This is done while serving compatible economic, political, cultural, and social needs at various geographic levels.

Future Landscapes Functions

Determine desired future landscape functions based on historic, ecological, economic, and social considerations.

Determining how future landscapes should function is an integrated process involving coordination across ecosystems.

Ecosystems do not have absolute or permanent boundaries. Things move around, in, and between them over space and time. Every ecosystem is a subset of a larger one. Ecosystems change and evolve in response to both human influence and natural events.

Descriptions of the desired landscape functions integrate ecological, economic, political, and social considerations and provide guidance for management decisions and actions. Federal agencies, private landowners, State agencies, counties, and interested people work more closely together to determine the values, products, and services to be derived from natural resources so that the quality of life for future generations can be maintained over the long term.

Partnerships

Involve the public and coordinate with other land owners -Federal, State, and private.

Because ecosystems often cross administrative, jurisdictional, or ownership boundaries, partnerships at local, regional, national and even global scales with other agencies, parties and interests will be essential. Ecosystem management requires continuing cooperation among varied public interests, land managers, land users, resource disciplines, scientists, and technicians. This coordination does not imply a desire or right of the BLM to manage

private, State or other Federal agency property. More and more resource issues require cooperation and coordination for shared decision making. Issues such as anadromous fish and migratory bird habitat, smoke from prescribed fires, air and water quality, and forest health require a need to share information, coordinate management strategies, set consistent management objectives, provide training and educate the public.

It is also important that collaborative efforts to share data with scientists, university partners, and others be encouraged and strengthened to help develop adequate knowledge for ecosystem management.

A basic understanding of ecological processes is important. Therefore, education and public outreach will be critical requirements for a broad spectrum of partners.

Science In Decision Making

Use scientific information for decision making; emphasize research and rapid technology transfer.

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Scientific information is integrated with management actions at all geographic levels with a new emphasis on large geographic scales. More research and technology is directed at solving problems and answering questions at landscape and regional levels. Research also concentrates on providing information that answers practical questions asked by land managers for making sound decisions on-the-ground.

Research requires a high degree of interdisciplinary cooperation and coordination. A blend of social, physical, economic, and biological research is required because of the interdependency of a strong economy and a healthy environment. Closer working relationships between resource managers and researchers are established. Better cooperation is necessary among agencies, universities, and other sources of expertise.

Reliable, relevant science and technical knowledge is made available and used in making resource management decisions. New ecological information is generated and compiled to better understand ecological responses to management actions. Effective methods and technologies for restoring impaired ecosystems are devised.

Networks among scientists, managers and the public through which technical and scientific information can be shared, applied, tested, and institutionalized are formed. This may require a reorientation of roles and responsibilities, developing and employing new expertise, and specialization in some segments of existing work forces.

Data Leads to Knowledge

Organize and integrate effective and efficient data and data gathering systems to insure data are used to enhance knowledge (inventory, monitoring, automation).

Data from traditional inventories and monitoring must be analyzed and more effectively used to support management of lands and resources. New processes are developed to convert this data to knowledge of ecological systems and their relationship to social, cultural and economic values. This includes ecological classification systems, and inventory and monitoring processes at larger, more regional scales. Data analysis systems such as the Geographic Information System (GIS), Fire Effects Information System, and others are fully utilized to determine the effects of various land treatments and uses on ecological processes. As the decision process incorporates more social science disciplines such as sociology and economics, steps are taken to provide corresponding data and analysis.

Internal Integrated Approach

Use an interdisciplinary, integrated internal approach to land management.

Ecosystem management requires that an interdisciplinary approach be used consistently within BLM and that priorities, objectives, and actions among internal BLM programs and functions be better coordinated. Within this framework, operations that currently are separate, such as budget, planning and organizational structure, would accommodate an integrated approach to land management. Program advocacy yields to ecosystem advocacy. *

Thinking Big and Thinking Small

Expand thinking to higher, longer-term levels (temporal and spatial).

Because ecosystems occur at all scales from local, regional, and national to global; different, but coordinated, management strategies are developed. Concern, and therefore management, often focuses solely on local environments. However, BLM is increasingly moving towards managing local environments in relation to more regional landscape levels. For example, several agencies, including the BLM, and private organizations are involved in restoring and managing wetlands on a national and international scale. Managing for biological diversity and sustainable development requires considering the relationships of actions at the local level and their influence on regional, national, and global levels and vice versa.

Many land management actions are currently couched in terms of short term benefits. Managing ecological systems requires knowledge of natural processes and the effects of human action on those processes over time. Diversity and productivity of ecosystems are products of time and human involvement.

Connecting the Landscape


Think in terms of relationships such as headwaters to downstream, above ground to below ground, up slope to down slope.

Using an ecological approach reconnects various portions of landscapes previously managed as separate entities. Uplands connect to riparian areas, which connect to streams. Soils and ground water are not considered separately from the vegetation and streams. This connectivity includes upstream to downstream components and soil to canopy components.

Monitoring and Adaptation

Adapt management prescriptions as a result of changing ecosystem conditions, changing management by others within ecosystems, and improved understanding of the relationship between ecosystem health and land uses.

Comprehensive monitoring programs are needed in order to understand the relationship between land use practices and resulting health of ecosystems at various scales. Consistent and high quality monitoring information is integrated into management decisions so that management can be adapted as conditions and needs change. The scale of many monitoring programs is broadened to detect changes in ecosystem processes and functions as well as serving as overall indicators of biological integrity. This requires closer coordination on interagency monitoring efforts such as the national Environmental Monitoring and Assessment Program (EMAP).




MOVING TOWARDS ECOSYSTEM MANAGEMENT : EXAMPLES IN THE BLM

Although the BLM has not yet implemented an integrated ecosystem management approach, many of the principles are already being applied in various programs. Some examples are:

Columbia and Snake River Anadromous Fish

In the Columbia and Snake River Basins of the Pacific Northwest, the BLM is working with the Forest Service, the National Marine Fisheries Service, the Pacific Rivers Council, several user groups, and the public to undertake a coordinated approach to salmon recovery. Although the primary objective is to manage the resources, social and economic concerns also are being addressed as priorities in this effort directed at entire ecosystems. The process is characterized by a great deal of internal and external coordination and public involvement. BLM funding comes from the range; wildlife; soil, water and air; and forestry programs.

California Bioregions




In California, the BLM has joined other Federal, State, and County partners in signing a memorandum of understanding to develop a coordinated State-wide biodiversity planning strategy. This effort organizes the principal land management agencies in the State under the long-term goal of conserving the rich natural heritage of each major bioregion in California, while sustaining economic growth and development.

Western Oregon Resource Management Plans

In western Oregon, the BLM is developing resource management plans for 2.5 million acres to promote healthy and diverse forest types, including important habitat for old growth dependent species while also providing other forest values and products for the public.

Team Approach to Coal Issues



In the Powder River Basin of Wyoming and Montana, the BLM has made substantial progress in diffusing conflict which halted coal leasing for years. Under the umbrella of a Federal State Coal Advisory Board and a Regional Coal Team, a deliberate, multi-faceted process has been established that assures complete analysis of all issues in the Basin and the involvement of all parties in the analysis and decision making process, extending from pre-leasing to operations and production activities.




Riparian Initiative

The BLM is integrating resource programs through its riparian area management initiative. The range; wildlife and fisheries; and soil, water and air programs all fund riparian management within BLM. The goal is to achieve "proper functioning condition," which encourages a focus on the overall health of riparian areas rather than individual species or vegetation types.

Bring Back the Natives

The BLM, Forest Service and National Fish and Wildlife Foundation are into the second year of an aquatic species restoration campaign that emphasizes management of entire watersheds to improve rivers and streams on the public lands. Coordinated management of BLM and Forest Service lands is the key to this effort.

Fire Protection Initiatives



The Bureau also is a partner in the National Wildland/Urban Interface Fire Protection Initiative. This effort involves working with homeowners, the insurance industry, developers, zoning and planning commissions, landscape architects, and the fire community to raise awareness of and plan for fire problems in wildland environments. A primary objective is to reduce risks to personal property and lives through prevention activities.

GLOSSARY

The following terms have been defined differently by various groups and individuals. A number of accepted definitions are provided for each term. This paper uses the definitions marked with an asterisk.*

***Biological Diversity:** The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. *1991 Keystone Policy Dialogue on Biological Diversity on Federal Lands.*

The definition of biological diversity used in this paper also would include the following: Biological diversity focuses on native or endemic species (including those which may have been extirpated from an area). Non-native species (exotics) are evaluated separately on the basis of their social and economic value, and upon their impacts to native species and landscape functions.

Biodiversity (biological diversity): The variety of organisms considered at all levels, from genetic variants belonging to the same species through arrays of genera, families, and still higher taxonomic levels, includes the variety of ecosystems, which comprise both the communities of organisms within particular habitats and the physical conditions under which they live. *E.O. Wilson - The Diversity of Life*

***Bioregion:** A territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related, interconnected ecosystems. *Global Biodiversity Strategy*

Bioregion: A continuous natural area, such as a river system or mountain range, large enough to extend beyond political boundaries. *E.O. Wilson - The Diversity of Life*

***Ecosystem:** Humans as a part of, not apart from, a life support system composed of the atmosphere, water, minerals, soils, plants, animals, and microorganism that function together to keep the whole viable. *E.P. Odum 1970*

Ecosystem: The complex community of organisms and its environment functioning as an ecological unit in nature. *Webster Dictionary*

Ecosystem: The organisms of a particular habitat together with the physical environment in which they live; a dynamic complex of plant and animal communities and their associated non-living environment. *1991 Keystone Policy Dialogue on Biological Diversity on Federal Lands.*

Ecosystem: All organisms of a given place in interaction with their non-living environment. *Forman & Goodman, Basics from Landscape Ecology*

***Ecosystem Management:** The skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values, and services over the long-term. *Adapted by USFS from Webster's Dictionary*

Ecosystem Management: The skillful, integrated use of ecological knowledge at various scales to produce desired resource values products, services and conditions in ways that also sustain the diversity and productivity of ecosystems. *Forest Service 6/25/92*

***Landscape:** An area composed of interacting and interconnected patterns of habitats (ecosystems) that are repeated because of geology, landform, soils, climate, biota and human influences throughout the area. A landscape is composed of watersheds and smaller ecosystems. It is the building of biotic provinces and regions. *Adapted from Forman & Goodman found in James C. Overbay, Ecosystem Management, USFS*

Landscape: A heterogeneous land composed of a cluster of interacting ecosystems that is repeated in similar form through out. *Forman & Goodman from Basics from Landscape Ecology.*

***Partners :** Private organizations, universities, individuals, and other organizations with which the BLM works to accomplish common, goals, objectives and activities. *adapted from the Forest Service*

***Regional Ecosystems:** Large land areas that encompass many biological communities and land management regimes and are identifiable by climate, landform, soils, and landscape patterns. *Keystone Policy Dialogue*

***Stewardship:** One called to exercise responsible care over possessions entrusted to him. *Webster's Third New International Dictionary, 1976.*

Sustainability: The ability to a sustain desired condition or flow of benefits over time. *Adapted from Webster & Cordray & Gale, Journal of Forestry, 1991*

***Sustainable Development:** The use of land and water to sustain production indefinitely without environmental deterioration, ideally without loss of native biodiversity. *E.O. Wilson, The Diversity of Life*

***Sustainable Ecosystem :** Management of ecosystems so that the desired mix of values and resources are tempered to ensure that their capabilities and suitabilities are not compromised for future generations. *Forest Service - An Ecological Approach to Management*

Sustainable Ecosystem: A condition in which human activities within a landscape are conducted and coordinated to ensure the long term preservation and stability of the biotic and abiotic components of the ecosystem. These human activities have sufficient economic diversity to preserve and exercise options which meet changing economic and social conditions over time.

Sustainable Ecosystem: The ability to sustain diversity, productivity, resilience to stress, health, renewability and/or yields of desired values, resource uses, products or services from an ecosystem while maintaining the integrity of the ecosystem over time. *Forest Service—Fire Related Considerations & Strategies in Support of Ecosystem Management. 1/93*

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